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EC70-790 Slotted Floors for Swine

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SLOTTED FLOORS FOR SWINE

Prepared by E. A. Olson, Extension Engineer (Farm Building)

More than any other factor, the adoption of slotted floors for swine housing has accelerated the trend to confinement. Before their use, the amount and type of labor needed to scrape or wash the feeding floor and dispose of the wastes discouraged many producers from confinement housing.

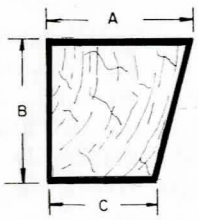
Materials

Wood, concrete, and metal have all been used effectively for slotted floors.

Wood slats have the lowest first cost and also the shortest life. Oak is best, but other hardwoods such as hickory and maple can be used. Preservative treatments may be used if pentachlorophenol or some water-based preservative is used and 2 to 4 weeks are allowed for the dilutent to evaporate from the treated wood before hogs come in contact with it.

Pig performance can be reduced by variable spacings resulting from warping (particularly likely to happen with slats less than 3 inches wide), wear, careless installation, insecure fastening, and uneven heights. Wood slats can become quite slick. Their maximum life expectancy is between 2 and 4 years, and even less in areas of intensive use such as around feeders and waterers.

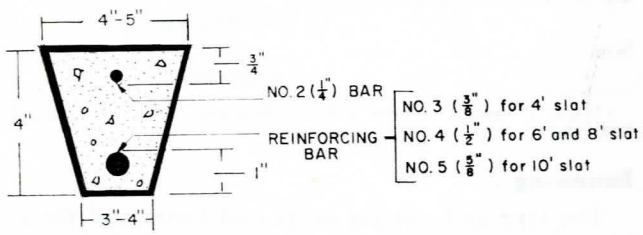
The recommended dimensions for wood slats are:



	A	B	C
4-FOOT SLATS	3"-5"	2½"	2¼"-4"
6-FOOT SLATS	3"-5"	3"	2¼"-4"
8-FOOT SLATS	3"-5"	3½"	2¼"-4"
10-FOOT SLATS	3"-5"	4"	2¼"-4"

The A dimension must be greater than the C dimension so the spacing will not become clogged. The slats are usually formed by ripping a rectangular timber on the diagonal, resulting in a vertical edge and an inclined edge.

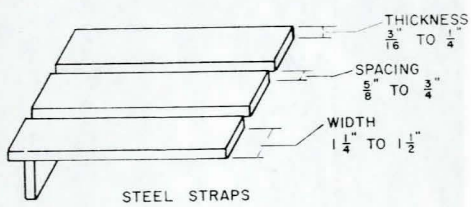
Concrete slats are the most durable and have worked extremely well, particularly for the finish-weight hog. They can be precast by a concrete products plant, or commercial forms are available for casting the slats in place. Precast slats have the advantage of quality control during proportioning the mix, casting the slat, and curing. This advantage is somewhat offset by the extra costs of transportation to the site and extra labor for mortaring the slats in place. Recommended dimensions for concrete slats are the same for 4-, 6-, 8-, and 10-foot slats except for the size of the reinforcing bar.



The ¼-inch bar in the top of the slat can be omitted when slats are cast in place and not moved. Use at least a 7½ bag mix of air-entrained cement with a 2-inch to 3-inch slump, a maximum-sized aggregate of ½ inch to ¾ inch, and a 28-day strength of at least 3,500 pounds per square inch. Give the slats a smooth steel-trowel finish to reduce leg and knee abrasions. This is particularly necessary for farrowing and nursery floor slats. For proper curing, protect the slats from drying out for 5 days by covering with plastic, by spraying on a curing compound, or by covering with a wetted layer of straw.

Metal of various designs has been used. Flattened expanded metal (¾ inch, 9-11 gauge) has proved to be excellent for pigs under 50 pounds, but does not last as long when subjected to concentrated traffic of heavier animals. Many of the early metal slats did not prove satisfactory because corrosion attacked the steel from the underside and caused failure after 2 to 4 years. Steel straps 1¼ to 1½ inches wide and 3/16

¾" FLATTENED EXPANDED METAL



STEEL STRAPS

COOPERATIVE EXTENSION SERVICE, UNIVERSITY OF NEBRASKA COLLEGE OF AGRICULTURE AND HOME ECONOMICS, AND U. S. DEPARTMENT OF AGRICULTURE COOPERATING. E. F. FROLIK, DEAN; J. L. ADAMS, DIRECTOR

or ¼ inch thick have worked well when spaced ⅜ inch apart for farrowing and ¾ inch apart for nursery units. Porcelainized steel, aluminum alloy, and other metal slats are on the market but information on performance is still limited. Research is continuing on corrosion-resistant metals and protective coverings.

Spacing

Narrow slats require a narrow spacing while wide slats can be spaced farther apart without adverse effects. The recommended spacings are:

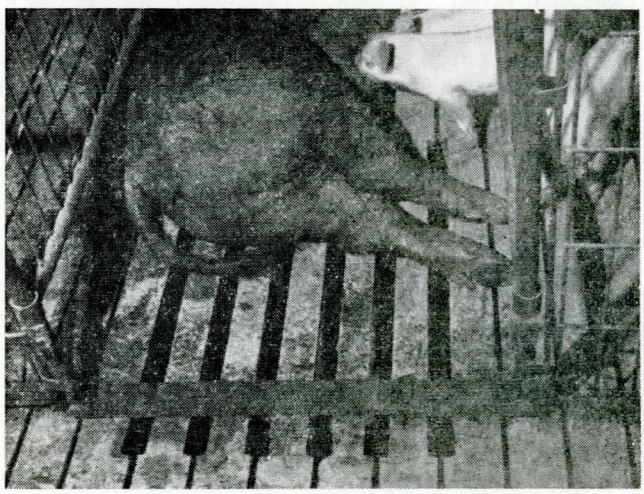
	Narrow slat (1¼" to 2")	Wide slat (4" to 5")
New-born pig	⅜"	⅜" or 1"[a]
25- to 40-pound pig	½"	¾" to 1"
40- to 220-pound pig	not recommended	1"
Sow	not recommended	1¼"

[a] When 1" spacing is used with new-born pigs, cover with grate for first 2 days.

Farrowing

The type and spacing of slotted floors and the environmental conditions are more critical during farrowing than for older pigs. For farrowing, slats must either be spaced ⅜ inch to prevent the pigs from getting their feet between the slats or over ¾ inch so they can pull the legs out again. The wider spacing must be covered with a grate before farrowing starts and for 48 hours after farrowing to give the small pigs time to gain enough strength to recover if they slip through the spacings.

Farrowing crates can be totally slotted or slotted only front and rear. For partially slotted crates, about 1 foot in front and about 2½ feet at the rear should be slotted. The slotted area in front is to take care of the spillage from the waterer and the manure the pigs deposit in the front corners from 3 weeks of age and older.



For totally slotted farrowing crates, use slats 4 to 5 inches wide spaced ⅜ inch except for 1-inch spacing in a 2½-foot section at the rear of the sow, as shown in the picture. As mentioned before, the wide spacing must be covered with a grate during farrowing and for 48 hours after. Running slats parallel to the sow gives her good footing for getting up and down.

During cool periods, supplemental heat is needed to keep the small pigs comfortable. Either use a space heater and keep the entire room above 80° F. at farrowing time, or heat the room to 65° to 70° and provide extra heat in the pig creep. Look at the pigs as well as the thermometer to see if they need more heat. If the pigs are piling up and shivering and have rough hair coats, the building needs more heat. Supplemental heat also helps keep the building dry.

Nursery and Finishing

Most research indicates no difference in performance between pigs raised on slotted floors (either partially or totally slotted) and pigs raised on solid floors, when environment, feed, and management are equal.

Pens with totally slotted floors consistently remain cleaner than those partially slotted. Feed wastage is not so readily detected with totally slotted floors, but a small solid area around the feeder would permit easier observation of wastage, so feeder adjustments could be made. Cleanliness of partially slotted pens tends to increase as the animals increase in size, and the pens are noticeably cleaner after the pigs weigh 100 pounds. At least one-fourth of the floor area should be slotted. In tests, pens with 50 percent of the floor slotted have been consistently cleaner than those with only 25 percent slotted.

In general, the larger the pig the wider the slat that can be used without sacrificing cleaning efficiency. Small pigs provide less effective traffic to work waste material through the spacings. Slats as wide as 8 inches spaced 1 inch apart have performed satisfactorily for finish-weight hogs. Extra-wide slats have some advantages of both a solid floor and a slotted floor.

This material has been adapted from information originally prepared by Arthur J. Muehling, Extension Agricultural Engineer, University of Illinois.